The Young, the Old, and the Economists: Rethinking How Agencies Account for Age in Cost-Benefit Analysis

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ABSTRACT:

Federal agencies count all fatalities prevented by regulation as having the same value for the purposes of cost-benefit analysis, making no adjustment for the age of the person saved. This uniform valuation is guided by empirical studies that find that the young are not willing to pay more than the elderly for small risk reductions in private markets. This Note argues for a different approach. It proposes that agencies take account of a previously ignored body of "public choice" research that finds that most individuals think government should adopt lifesaving programs that benefit the young over those that benefit the old. These data illustrate a divergence between people's private and public preferences. While the economic theory that guides current agency practice prioritizes the former over the latter, this Note argues that it should be the other way around. The Note maintains that public choice data reflect a wider range of societal commitments than individual willingness-to-pay metrics, and therefore that the use of public choice data could help agencies satisfy their mandate under Executive Order 13,563 to engage in broader forms of analysis. The Note also posits that public choice data actually provide a better guide to the welfare consequences of prioritizing lifesaving regulations for different age groups than do individual willingness-to-pay data. It accordingly recommends a new system of age adjustment based on public choice results.

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INTRODUCTION

Seventy-three-page technical addenda to Environmental Protection Agency (EPA) regulatory analyses do not usually attract much attention. But, as EPA Administrator Christine Todd Whitman would discover in the spring of 2003, every rule has its exceptions.

The trouble started in early April, when no fewer than seventeen senior citizens took to the microphone at an EPA-sponsored "Listening Session" to excoriate Whitman over the Agency's recently released *Methodologies for the Benefit Analysis of the Clear Skies Initiative.*[1] As the angry seniors' comments revealed, this dry quantitative assessment, which reviewed the consequences of reducing emissions from electric power-generating sources, had done something quite controversial.[2]

The problem arose from the EPA's method of putting a price on human life in order to monetize the health and safety gains associated with cleaner air. The mere fact that the agency had engaged in this kind of arcane arithmetic was unremarkable, as dozens of agency cost-benefit analyses do the same every year. However, the way in which the *Clear Skies* analysis had carried out its life pricing was unusual, and struck many of the Listening Session's guests (or perhaps more importantly, the representatives from the Public Interest Research Group (PIRG) who coordinated the seniors' demonstration[3]) as morally obscene.

Calculating the value of a statistical life (VSL) requires deciding whether all lives count for the same amount. In particular, should the young, who have long lives ahead of them, receive the same weight as the elderly, who are likely to die much sooner? The *Clear Skies* analysis caused trouble because of the approach it took to this dilemma. In its primary benefit calculation, the analysis used a constant VSL of $6 million to monetize each of the fatalities prevented by the *Clear Skies Initiative.*[4] In a sensitivity analysis, however, the report lowered the VSL for individuals over sixty-five by 37%.[5]

It was this "senior discount" that galvanized the well-organized army of seniors to challenge the EPA's analytical techniques at the Listening Session,[6]

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1. For a transcript of the proceedings, see *Comments from the Tampa, FL Listening Session*, EPA, http://www.epa.gov/aging/listening/2003/tampa.htm (last visited May 23, 2012).

2. *Technical Addendum: Methodologies for the Benefit Analysis of the Clear Skies Initiative*, EPA 4 (Sep. 2002), http://www.epa.gov/clearskies/tech_adden.pdf [hereinafter *EPA Methodologies*].

3. *See* Cindy Skrzycki, *Under Fire, EPA Drops the "Senior Death Discount,"* WASH. POST, May 13, 2003, at E.01.

4. *EPA Methodologies*, *supra* note 2, at 33 (citing this VSL estimate in 1999 dollars).

5. *Id.* at 35.

6. The policy's opponents included AARP Director of Federal Affairs David Certner, who said he was "deeply troubled" by the senior discounting policy. Skrzycki, *supra* note 3.

and the resulting political firestorm would burn throughout the spring. At event after event, Whitman was greeted by crowds of angry protesters who wielded signs proclaiming "seniors on sale" and distributed pamphlets denouncing the EPA's decision to make seniors "worth 3/5 of a person."[7] (In a cruel twist of fate, the adjustment used in the EPA's analysis turned out to be virtually identical to the infamous discount of slaves that appeared in the Three-Fifths Clause of the original U.S. Constitution.) By May, Whitman had seen enough. At a Listening Session event in Baltimore, she preempted the litany of angry comments by declaring: "The senior discount factor has been stopped . . . . It has been discontinued [by the OMB (Office of Management and Budget)]. E.P.A. will not, I repeat, not, use an age-adjusted analysis in decision making."[8] The House of Representatives quickly followed suit, barring funding for any analyses that employed such a technique[9] —a powerful testament to the fact that "tangling with the AARP can be more dangerous to a politician than blocking the entrance to the Boca Raton Sizzler when it opens for the early bird special."[10]

This fracas sounded the death knell for senior discounting in cost-benefit analysis (CBA). In its wake, Office of Information and Regulatory Affairs (OIRA) Administrator John D. Graham circulated a memo advising all agencies to discontinue their use of VSL age adjustments.[11] Subsequently, OMB's *Circular A-4*, which provides official executive branch guidance on conducting CBA, warned agencies that they "should not use an age-adjustment factor in an analysis using VSL estimates."[12]

Public outrage is not the only reason why senior discounting has fallen out of favor, though. The regulatory establishment may have retreated from the practice in response to popular pressure, but it defends its current use of uniform mortality risk valuations by pointing to empirical data. Agencies calculate the dollar value of a prevented fatality under the assumption that "the value of a reduction in mortality risk . . . is what a person is willing to pay for it."[13] The

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7. Skrzycki, *supra* note 3, at E2.

8. *See* Katherine Q. Seelye & John Tierney, *E.P.A. Drops Age-Based Cost Studies*, N.Y. TIMES, May 8, 2003, http://www.nytimes.com/2003/05/08/us/epa-drops-age-based-cost-studies.html.

9. H.R. 2673, 108th Cong. div. G, tit. IV, § 419 (2004).

10. Robert Hahn & Scott Wallsten, *Whose Life Is Worth More? (And Why Is It Horrible to Ask?)*, WASH. POST, June 1, 2003, at B3.

11. Memorandum from John D. Graham, Administrator, Office of Information and Regulatory Affairs, to the President's Management Council (May 30, 2003). http://www.whitehouse.gov/sites/default/files/omb/assets/regulatory_matters_pdf/pmc_benefit_cost_memo.pdf.

12. *Circular A-4: Regulatory Analysis*, U.S. OFFICE OF MGMT. & BUDGET 30 (Sept. 17, 2003) [hereinafter *Circular A-4*], http://www.whitehouse.gov/sites/default/files/omb/assets/omb/circulars/a004/a-4.pdf.

13. Sci. Advisory Bd., *Advisory on EPA's Issues in Valuing Mortality Risk Reduction*, EPA, at D-10 (Oct. 12, 2007), http://nepis.epa.gov/Adobe/PDF/P10007U3.pdf.

VSL is accordingly determined by looking at empirical studies of how much individuals are willing to pay to reduce small risks to their lives.[14] Any age adjustment responds to what these empirical studies show.

In 2003 this approach pointed towards senior discounting, because some research at the time suggested that the elderly might be less willing to pay for safety than their younger counterparts.[15] Since then, however, new evidence has emerged challenging the idea that age decreases individuals' willingness to pay (WTP) to reduce mortality risks.[16] As a result, at present, adjusting the VSL for age is not only politically problematic but also, according to the postulates of welfare economics, inaccurate.[17] The logic underlying traditional CBA is the logic of the market—it seeks to give everyone the amount of safety she is willing to pay for. Therefore, unless dramatic new evidence on the relationship between age and WTP for risk reductions were to emerge, orthodox economically oriented policymakers would see little reason to account for age in regulatory analyses.[18]

Yet there is something missing from this picture, something that seems lost on the senior discount's angry opponents, its beleaguered creators, and, most of all, the technocrats who believe this is all a question of choosing the right econometric model: As a society, how do we feel that government should allocate lifesaving resources between the old and the young? In the midst of the senior discounting tumult of 2003, few stopped to consider a fairly intuitive point that the economist Alan Krupnick made to the New York Times: "If you ask people on the street whether they prefer a policy that saves the life of a young person or an elderly person, I think most people, including the elderly, would save the young person."[19] As it turns out, Krupnick's conjecture is supported by more than just intuition. A large literature explores precisely this question by eliciting individuals' preferences over government lifesaving programs that benefit different age groups. Unsurprisingly, these studies identify an

14. See Lisa A. Robinson, *How US Government Agencies Value Mortality Risk Reductions*, 1 REV. ENVTL. ECON. & POL'Y 283 (2007), for a comprehensive overview of government practice.

15. *EPA Methodologies*, *supra* note 2, at 35 (citing MICHAEL JONES-LEE, THE ECONOMICS OF SAFETY AND PHYSICAL RISK (1989)).

16. *See* Joseph Aldy & W. Kip Viscusi, *Age Differences in the Value of Statistical Life: Revealed Preference Evidence*, 1 REV. ENVTL. ECON. & POL'Y 241 (2007); Alan Krupnick, *Mortality Risk Valuation and Age: Stated Preference Evidence*, 1 REV. ENVTL. ECON. & POL'Y 261 (2007).

17. *See* NAT'L ACAD. OF SCI., ESTIMATING MORTALITY RISK REDUCTION AND ECONOMIC BENEFITS FROM CONTROLLING OZONE AIR POLLUTION 157 (2008) ("Empirical evidence of how WTP varies with population and risk characteristics is not sufficiently consistent to support a change in th[e] practice [of using constant VSL].").

18. *Id.*

19. John Tierney, *Life: The Cost-Benefit Analysis*, N.Y. TIMES, May 18, 2003, http://www.nytimes.com/2003/05/18/weekinreview/life-the-cost-benefit-analysis.html.

overwhelming desire to prioritize the young over the old.[20]

In spite of their apparent relevance to public policy, however, these studies play no role in any cost-benefit analysis whatsoever. Because of its grounding in neoclassical welfare economics, current regulatory practice relies solely on evidence of how much individuals are willing to pay for small reductions in their risk of dying. It is oblivious to research on how society wants to see its regulatory priorities ordered.

This Note challenges agencies' methodological narrow-mindedness. It argues that that the traditional economic approach to age adjustment struggles to deliver on its self-proclaimed goal of maximizing social welfare, and decisively fails when the focus shifts to the broader type of analysis mandated by Executive Order 13,563, which calls on agencies to incorporate a wide range of societal concerns into their decision making.[21]

The possibility of using public choice studies to guide age-adjustment in cost-benefit analysis offers a more attractive vision of what regulatory analysis could look like. Specifically, public choice studies offer two advantages over the individual WTP evidence that undergirds the current regime. First, they provide a better guide to the welfare consequences of allocating risk reductions to individuals of different ages. This is because the conditions under which they elicit data are more likely to induce reflective contemplation and less likely to be corrupted by the influence of age-related changes in the marginal utility of money than individual WTP metrics are. Second, public choice studies respond to a broad range of citizens' beliefs on how to allocate lifesaving resources rather than only considering individual welfare, which allows them to provide a richer picture of sentiments on age adjustment. Therefore, incorporating public choice studies into cost-benefit analysis would help make the practice a better proxy for overall welfare and a more accurate reflection of society's full set of ethical convictions (including "extra-welfarist" values that go beyond individual wellbeing, such as fairness).

Part I provides an overview of the different methodologies employed by individual WTP and collective choice studies, respectively, and the divergent conclusions the two reach. It notes that current regulatory practice relies on the former but not the latter. Part II interrogates this choice on economists' own terms by asking which system of age adjustment provides the best proxy for overall welfare. It offers both traditional and behavioral economic arguments for why public choice data is actually better suited for this task than individual WTP metrics. Part III moves beyond welfarist analysis. It finds that individual WTP studies are fundamentally incapable of reflecting the broad range of extra-

20. *See infra* Part I.

21. *See* Exec. Order No. 13,563, 76 Fed. Reg. 3821, 3821 (Jan. 18, 2011).

welfarist concerns implicated by the question of how to prioritize risk reductions for individuals of different ages, but that public choice studies do a good job of capturing many of these considerations. It also attempts to reconcile public choice findings with the strong opposition to senior discounting expressed in 2003. Part IV discusses how to incorporate public choice data into regulatory practice in light of its apparent advantages. Part V concludes.

I. TWO WAYS OF ASKING A QUESTION

Individual WTP and public choice studies offer two fundamentally different approaches to the question of how to allocate lifesaving resources between different age groups. They also offer two fundamentally different answers. While the former approach looks at respondents' tradeoffs between risk and personal consumption and fails to find evidence for senior discounting, the latter investigates individuals' beliefs about how governments should prioritize different lifesaving projects, and reveals a strong preference for protecting the young over the old.

A. Individual WTP Studies

Individual WTP research proceeds in two primary ways: through revealed preference studies, which look at the wage premiums offered for risky jobs, and through stated preference studies, which survey respondents about their willingness to pay for hypothetical risk reductions.[22] Both of these techniques are market-based mechanisms—they seek to discover how much safety consumers would be willing to purchase in well-functioning markets.[23] As a result, a public policy that responds to this type of research allocates safety between young and old with reference to the market. It holds that the young should have more safety than the old if, and only if, they are willing to pay more for it.[24]

As it turns out, the young are not willing to dole out more to protect themselves from harm. Revealed preference studies suggest that WTP for mortality risk reductions follows an inverted-U trajectory over the course of a lifespan, peaking in late middle age.[25] Furthermore, the curve's rise is steeper than its decline, meaning that the average sixty-year-old is willing to pay

22. *See* Robinson, *supra* note 14, at 283–84. The EPA, for example, relies on 26 empirical studies for its VSL estimate, of which 21 are labor market revealed preference studies and 5 are contingent valuation surveys. *See* Nat'l Ctr. for Envtl. Econ. Office of Policy, *Guidelines for Preparing Economic Analyses*, EPA, at B-1–B-2 (Dec. 17, 2010) [hereinafter *EPA Guidelines*], http://yosemite.epa.gov/ee/epa/eerm.nsf/vwAN/EE-0568-50.pdf/$file/EE-0568-50.pdf.

23. *See* ELIZABETH ANDERSON, VALUE IN ETHICS AND ECONOMICS 191 (1993).

24. *See, e.g.*, Sci. Advisory Bd., *supra* note 13, at 10.

25. *See* Aldy & Viscusi, *supra* note 16, at 251–52.

considerably more to reduce mortality risks than the average twenty-year-old.[26] Stated preference studies, meanwhile, have trouble finding any consistent relationship between age and WTP. A 2007 meta-analysis concluded that the data paints "a mixed and somewhat confusing picture."[27] Neither set of studies, therefore, supports the conclusion that VSL decreases with age.[28]

The absence of an age-related decline in VSL is not a surprise for economic theorists. For decades, many economists have predicted that older individuals might pay more for mortality risk reductions than their younger counterparts, largely because they have more financial resources available and fewer alternatives on which to spend them.[29] With safety, as with any other good, willingness to pay is a function of both the utility gained through consumption and the utility lost through foregone alternatives. Insofar as the old face relatively low opportunity costs for purchasing risk reductions because of their financial circumstances, they will spend more to protect their lives.

As a result, a market-based answer says that we should not employ a higher VSL for the young since they are not willing to pay more for risk reductions. It dismisses any other inputs as little more than cheap talk.

B. Public Choice Studies

Public choice research approaches the question quite differently. Instead of asking respondents to choose between their own money and their own safety, it asks them how society should allocate risk reductions between different groups—for example, whether a limited supply of flu vaccines should go to the young or the elderly first.[30] These studies make no attempt to offer a roadmap for replicating market outcomes. They treat their respondents as citizens who must decide what their government should do, rather than as consumers who need only choose which private goods to purchase.

The literature finds that most individuals express a strong desire to allocate lifesaving resources to the young over the old. In one representative study, Maureen Cropper, Sema Aydede, and Paul Portney asked subjects to choose between lifesaving government medical programs that affected different age

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26. *Id.*

27. Krupnick, *supra* note 16, at 274.

28. The meta-analyses reflect the fact that more recent research, for example, Anna Alberini et al., *Does the Value of a Statistical Life Vary with Age & Health Status? Evidence from the US and Canada*, 48 J. ENVTL. ECON. & MGMT. 769 (2004), has largely failed to replicate the few early efforts, for example, *EPA Methodologies*, *supra* note 2, at 35 (citing JONES-LEE, *supra* note 15), that found a negative relationship between age and WTP.

29. *See, e.g.*, Donald S. Shepard & Richard J. Zeckhauser, *Survival Versus Consumption*, 30 MGMT. SCI. 423 (1984).

30. *See* Meng Li et al., *How Do People Value Life?*, 21 PSYCHOL. SCI. 163, 164 (2010).

groups. Their results suggested that respondents were indifferent between saving one twenty-year-old and *seven* sixty-year-olds.[31] Similarly, another team of researchers recently found that subjects were willing to trade the lives of ten sixty-year-olds for just one ten-year-old.[32] Not all studies uncover such dramatic results, but the direction of preference is quite consistent[33]: across many different surveys, individuals put a premium on saving the young over the elderly.[34]

It is tempting to assume that these results are driven by the self-serving chauvinism of youthful respondents, but this is not the case. The preference for prioritizing younger lives is evident across age groups—both young and old alike seem to embrace the notion that society should focus its lifesaving efforts on younger citizens.[35] Indeed, when researchers ask respondents to explain their choices, the experimental subjects embrace a number of compelling justifications for favoring younger individuals—notably, that the young deserve priority because they have longer future lifespans, have not yet had as many opportunities for living, and still have their most productive years ahead of them.[36]

Therefore, our preferences as citizens seem to diverge significantly from our preferences as consumers. While individuals are not willing to pay more to save their own lives when they are young, the principle that society should pay more to save young lives still enjoys widespread acceptance in public choice contexts.

C. The Current Approach

Economic theory's strident individualism and unwavering respect for consumer sovereignty leaves little room for the public choice approach. The traditional neoclassical view is encapsulated by W. Kip Viscusi, one of the pioneers of using VSL analysis in public policy, who writes that "[w]hat matters from the standpoint of benefit valuation is whether the personal willingness to pay has declined, irrespective of whether a third party government policymaker

31. Maureen L. Cropper et al., *Preferences for Life Saving Programs: How the Public Discounts Time and Age*, 8 J. RISK & UNCERTAINTY 243, 243 (1994).

32. Daniel Eisenberg et al., *Valuing Health at Different Ages: Evidence from a Nationally Representative Survey in the US*, 9 APPLIED HEALTH ECON. & HEALTH POL'Y 149, 150–53 (2011).

33. *See* Paul Dolan et al., *QALY Maximization and People's Preferences: A Methodological Review of the Literature*, 14 HEALTH ECON. 197, 202 (2005) ("[M]ost studies suggest that health gains to the old are weighted less.").

34. *See, e.g.*, Fredrik Carlsson et al., *Preferences for Lives, Injuries, and Age: A Stated Preference Study*, 42 ACCIDENT ANALYSIS & PREVENTION 1814, 1817–19 (2010); Olof Johansson-Stenman & Peter Martinsson, *Are Some Lives More Valuable? An Ethical Preferences Approach*, 27 J. HEALTH ECON. 739, 744–46 (2008); Li et al., *supra* note 30, at 166–67; Aki Tsuchiya et al., *Measuring People's Preferences Regarding Ageism in Health*, 57 SOC. SCI. & MED. 687, 692 (2003).

35. *See* Eisenberg et al., *supra* note 32, at 153; Li et al., *supra* note 30, at 165–67; Johansson-Stenman & Martinsson, *supra* note 32, at 746.

36. *See* Eisenberg et al., *supra* note 32, at 152; Tsuchiya et al., *supra* note 34, at 693–95.

thinks that people should be willing to pay less for risk reduction if fewer years of life are being saved."[37]

The regulatory state has resoundingly agreed. Current agency practice assumes that "the value of a reduction in mortality risk . . . is what a person is willing to pay for it."[38] Accordingly, OMB recommends that age adjustment respond to "the effect of age on VSL [i.e., individual WTP] estimates."[39] This approach elevates individual WTP data and leaves no room for a public choice approach. It ensures that regulatory analysis will respond to our preferences as consumers of risk in private markets, but ignore our preferences over what society should do. In the Parts that follow, I ask whether such an emphasis is justified.

II. WELFARE

In this Part, I challenge the consensus that basing VSL age adjustments on individual WTP best accomplishes the economist's traditional goal of maximizing social welfare. Public choice studies are less likely than WTP-based research to be corrupted by age-based differences in the marginal utility of money and by cognitive biases that make it difficult for individuals to value mortality risks. As a result, they are better designed to allow cost-benefit analysis to serve as a decision-making tool that points us towards welfare-enhancing policies.

A. What Is the Point of Cost-Benefit Analysis?

Determining how to account for age in cost-benefit analysis (CBA) requires answering the more fundamental question of what cost-benefit analysis is trying to accomplish in the first place.

CBA can trace its intellectual ancestry back to Jeremy Bentham, who believed in evaluating policy proposals by summing up the various pains and pleasures they generated.[40] In spite of its classical utilitarian pedigree, however, modern CBA harbors no pretensions of realizing Bentham's grand goal of true hedonic calculus. By the early twentieth century, economists had already given up on the Benthamite exercise of comparing cardinal utilities across different persons.[41] In its place, they embraced the Pareto criterion, which sidesteps the

37. W. Kip Viscusi, *The Devaluation of Life*, 3 REG. & GOVERNANCE 103, 112 (2009).

38. Sci. Advisory Bd., *supra* note 13, at D-10.

39. *Circular A-4*, *supra* note 12, at 30.

40. *See* JEREMY BENTHAM, AN INTRODUCTION TO THE PRINCIPLES OF MORALS AND LEGISLATION 32 (Hafner Press 1973).

41. *See generally* LIONEL ROBBINS, AN ESSAY ON THE NATURE AND SIGNIFICANCE OF THE ECONOMIC SCIENCE (1952) (rejecting the possibility of interpersonal utility comparisons).

problem of interpersonal utility comparisons by only conceding that a state of affairs *A* is better than an alternative *B* if at least one person is better off, and none is worse off, in *A* than in *B*.[42]

The Pareto criterion, though fairly uncontroversial, is also excessively restrictive. Almost no government policy proposals could meet its stringent requirements.[43] For the purposes of actual policy analysis, therefore, welfare economists turned to the Pareto criterion's funhouse mirror reflection, the Kaldor-Hicks test. A proposal passes Kaldor-Hicks if those who benefit from it could compensate those who are harmed and still have something left over—in other words, if the outcome created by the proposal could be transformed into a Pareto superior result through a costless transfer from its beneficiaries to its opponents (making it a "potential" Pareto improvement).[44]

Modern cost-benefit analysis is traditionally conceived as a way of determining whether a hypothetical policy satisfies the Kaldor-Hicks requirement. Cost-benefit analysis assesses the desirability of a proposal *A* against the status quo *B* by tallying each affected individual's "compensating variation" for *A*—the amount of money that, if received in *B*, would make her indifferent between *A* and *B*. If the resulting sum is positive, then the proposed policy "passes" cost-benefit analysis, and must, by definition, satisfy the Kaldor-Hicks test as well.[45]

Yet Kaldor-Hicks is a dubious standard. Since the theoretical compensations it envisions never actually take place, it is difficult to say with confidence that all—or even most—Kaldor-Hicks improvements actually make the world better in any meaningful way.[46] Indeed, it is easy to imagine many circumstances in which they do not. The economist Uwe Reinhardt, for example, once noted that a world in which you agree to let me punch you in the face in return for twenty dollars, and then I break your nose and run off without paying is, according to the Kaldor-Hicks test, superior to a world without the assault and broken promise.[47] The potentially significant disconnect between Kaldor-Hicks efficiency and welfare (to say nothing of justice) makes it unclear whether we should embrace cost-benefit analysis merely because it approves policies that are Kaldor-Hicks

42. *See* DANIEL M. HAUSMAN & MICHAEL S. MCPHERSON, ECONOMIC ANALYSIS, MORAL PHILOSOPHY, AND PUBLIC POLICY 136–40 (2d ed. 2006).

43. *See* Guido Calabresi, *The Pointlessness of Pareto: Carrying Coase Further*, 100 YALE L.J. 1221–22 (1991).

44. For an overview of Kaldor-Hicks, see RICHARD E. JUST ET AL., THE WELFARE ECONOMICS OF PUBLIC POLICY: A PRACTICAL APPROACH TO PROJECT AND POLICY EVALUATION 32–48 (2004).

45. *See* LEE S. FRIEDMAN, THE MICROECONOMICS OF PUBLIC POLICY ANALYSIS 169 (2002) (grounding CBA in the idea of Kaldor-Hicks efficiency).

46. *See* Ronald M. Dworkin, *Is Wealth a Value?*, 9 J. LEGAL STUD. 191, 196–201 (1980).

47. Uwe E. Reinhardt, *Reflections on the Meaning of Efficiency: Can Efficiency Be Separated from Equity?*, 10 YALE L. & POL'Y REV. 302, 312–13 (1992).

efficient.

Matthew Adler and Eric Posner offer a far more compelling alternative. According to their account, CBA should be understood as a welfarist decision-making procedure that carries no moral weight in and of itself, but is justifiable because it can, if practiced correctly, help direct us towards welfare-enhancing policies while providing salutary constraints on the discretion of fallible agency policymakers.[48] Moving from a standard wealth-maximizing justification for CBA to Adler and Posner's "weak welfarist" account puts the practice on firmer footing by eliminating the need to rely on Kaldor-Hicks efficiency as a legitimate standard of value.[49]

It also changes our understanding of age adjustment. Under the Kaldor-Hicks approach, the point of CBA is to approve policies that are potential Pareto improvements. If we accept that premise, then we should adjust the VSL for age if, and only if, the young are willing to pay more for risk reductions than the old, because only a person who is willing to pay a lot for safety will have a high compensating variation for a policy that delivers more safety to him. Within this framework, therefore, measures of how individual WTP for safety vary with age are the only relevant data for policymakers.

Under Adler and Posner's conception of CBA, however, (or Bentham's, for that matter), the point of cost-benefit analysis is not to identify potential Pareto improvements, but rather to serve as a proxy for social welfare.[50] In that case, we should adjust the VSL for age if, and only if, mortality risk reductions bring more welfare to younger individuals. This makes it far from obvious what type of evidence should govern CBA practice. The answer presumably rests on whether individual WTP or public choice metrics provide a better proxy for the differential welfare benefits of mortality risk reductions for the young and old.[51]

B. Do Individual WTP or Public Choice Studies Better Approximate Welfare?

Two considerations weigh in favor of public choice studies over individual WTP research. Individual WTP studies are likely to be insensitive to what we do care about—whether mortality risk reductions bring greater benefits to the young

48. *See* MATTHEW D. ADLER & ERIC A. POSNER, NEW FOUNDATIONS OF COST-BENEFIT ANALYSIS 62–100 (2006).

49. *Id.* at 63–69.

50. A premise of this approach is that a person's willingness to pay for a good and the welfare she receives from it will not always mirror each other.

51. Definitively answering this question would, of course, require an account of how to conduct interpersonal utility comparisons. While this problem deserves a more thorough treatment than this Note can give it, one possible solution comes from John Harsanyi's proposal to consider the preferences of impartial spectators over life-history lotteries. For an overview, see ADLER & POSNER, *supra* note 48, at 43–52.

or the old—and corrupted by a factor we should not care about—the differential marginal utility of money for different age groups. Public choice studies, by contrast, are completely uninfluenced by the interaction between age and the marginal utility of money, and significantly more likely to reflect relevant variations in the welfare effects of risk reductions for different age groups.

1. The Marginal Utility of Money

There is little doubt that studies of individual WTP for risk reductions are more highly influenced by age-based differences in the marginal utility of money than public choice studies are. Older individuals have, on average, significantly more financial resources available than the young, which drives up the amount they can spend on safety.[52] While WTP studies often control for income, they still miss most of this age-based resource disparity by failing to control for wealth.[53] Furthermore, even at any given level of resources, the elderly likely face low opportunity costs to spending on risk reductions, as their short remaining lifespans offer few attractive investment prospects, decreasing the returns to saving.[54] Additionally, their high background mortality risks produce a "dead anyway" effect: since they are likely to die in the near future, they have powerful incentives to spend down their resources quickly.[55] As a result, much of what individual WTP studies tell us is how the marginal utility of money varies with age, not how the benefits of a risk reduction vary with age.

While this information is highly relevant for individuals determining how much to pay for safety in private markets, it should not direct public regulatory policy. In private markets, consumers rightly vary their WTP for safety in response to the value of safety to them and the value of money to them. A cash-strapped individual might reasonably hesitate to purchase even a highly valuable risk reduction if doing so would require him to forego essentials like food and shelter. Policymakers, on the other hand, need not alter society's willingness to pay for safety based on the protected population's marginal utility of money. This is because in most cases, the beneficiaries of a government regulation do not also pay its costs.[56] The *social* opportunity cost of paying for a regulation usually

52. *See* Per-Olov Johansson, *On the Definition and Age-Dependency of the Value of a Statistical Life*, 25 J. RISK & UNCERTAINTY 251 (2002).

53. James K. Hammitt, *Valuing Changes in Mortality Risk: Lives Saved Versus Life Years Saved*, 1 REV. ENVTL. ECON. & POL'Y 228, 237 (2007).

54. *See* Yew-Kwang Ng, *The Older the More Valuable: Divergence Between Utility and Dollar Values of Life as One Ages*, 55 J. ECON. 1, 9–11 (1992).

55. *See* Ariel Porat & Avraham Tabbach, *Willingness to Pay, Death, Wealth, and Damages*, 13 AM. L. & ECON. REV. 45, 45–49 (2011); John W. Pratt & Richard J. Zeckhauser, *Willingness to Pay and the Distribution of Risk and Wealth*, 104 J. POL. ECON. 747, 762 (1996).

56. For an extensive treatment of this argument, see Cass R. Sunstein, *Valuing Life: A Plea for Disaggregation*, 54 DUKE L.J. 385, 434–39 (2004).

bears no relation to the financial circumstances of those it protects.[57]

Choosing to base our approach to age adjustment on individual WTP is tantamount to pegging the level of safety that the government should provide to the financial situation of the individuals receiving it[58]—something that we (rightly) refuse to do in most other contexts.[59] Therefore, if we hope to make CBA approximate welfare as closely as possible, we should adjust the VSL only in response to age-based differences in the value of mortality risk reductions, not age-based differences in the marginal utility of money.[60]

Public choice studies fit the bill well in this respect because they are entirely unaffected by age-based differences in the marginal utility of money. Unlike individual WTP studies, they ask their subjects to choose between risks and other risks, not between risks and money. A respondent's personal finances have little direct effect on his preferences for, say, allocating flu vaccines between young and old.[61] Accordingly, we need not be concerned that public choice data are primarily driven by opportunity cost effects.

2. Cognitive Biases

The real question, therefore, is whether public choice studies can accurately reflect the differential benefits of risk reductions to different age groups, or at least do so better than studies of individual WTP. One of the oldest traditions of economics maintains that individuals are the best judges of their own welfare.[62] As John Stuart Mill famously argued, "with respect to his own feelings and circumstances, the most ordinary man or woman has means of knowledge

57. The benefits of the Clean Air Act, for example, tend to accrue disproportionately to poor and minority communities in spite of the fact that the costs are largely borne elsewhere. *See* Matthew E. Kahn, *The Beneficiaries of the Clean Air Act*, 24 REGULATION 34, 35–38, (2001). This fact—along, of course, with egalitarian ethical convictions—helps explain why agencies do not bump up the VSL for the rich in spite of powerful evidence that the demand for safety displays positive income elasticity. *See* W. Kip Viscusi & Joseph E. Aldy, *The Value of a Statistical Life: A Critical Review of Market Estimates Throughout the World*, 27 J. RISK & UNCERTAINTY 5, 36–38 (2003).

58. Policymakers do not appear to be oblivious to this fact. *Circular A-4* tells agencies to "adopt a larger VSLY estimate for senior citizens because seniors face larger overall health risks and they may have accumulated savings to spend on health and safety." *Circular A-4*, *supra* note 12, at 30.

59. For example, we refuse to adjust the VSL for race in spite of the fact that African-Americans display lower willingness to pay for risk reductions than whites. *See* W. Kip Viscusi, *Racial Differences in Labor Market Values of a Statistical Life*, 27 J. RISK & UNCERTAINTY 236, 252 (2003).

60. *See* John W. Pratt & Richard J. Zeckhauser, *Willingness to Pay and the Distribution of Risk and Wealth*, 104 J. POL. ECON. 747, 762 (1996).

61. *See, e.g.*, Eisenberg et al., *supra* note 32, at 152 (finding that income was "not significantly associated with reported preferences" on allocating lifesaving resources to different age groups).

62. *See* LEONARD W. SUMNER, WELFARE, HAPPINESS, AND ETHICS 113–22 (1996).

immeasurably surpassing those that can be possessed by anyone else."[63] Why, then, should we trust public choice studies, which measure how much third parties value risk reductions to different age groups, over studies of individual WTP, which measure what the members of those age groups think themselves?

The answer lies in the limits of human cognition. While neoclassical economics posits that individuals are always the best judges of their own welfare, modern psychology begs to differ.[64] In some situations, humans act in ways that they would not endorse under conditions of full information and rationality. Decisions regarding how much mortality risk protection to buy are precisely the sorts of complex, affect-laden choices that are most likely to diverge from the stable, well-considered preferences of the agents that make them.[65] As a result, there may be good psychological reasons to believe that individual WTP data are not particularly reliable, and that the public choice elicitation framework offers a more effective means of gauging individuals' reasoned understandings of how age affects the value of safety.

First among these reasons is that it is extremely difficult for a person to appreciate what the length of his expected future lifespan actually means. We intuitively believe that risk reductions are more valuable to twenty-year-olds than to eighty-year-olds because twenty-year-olds can be expected to live much longer.[66] After all, lives are never truly "saved;" they are merely extended, and it seems highly relevant whether that extension is for six years or for sixty.[67] An empirical study can accordingly give us meaningful information about the relative value of risk reductions to different age groups only if its subjects are at last somewhat attuned to the length of their future lifespans. If individuals are oblivious to this important consideration, then their choices carry little normative weight.

Unfortunately, human beings are notoriously bad at understanding how a good's magnitude affects it value. One well-known study found that different groups of subjects demonstrated identical WTP to save 2,000, 20,000, or 200,000

63. JOHN STUART MILL, ON LIBERTY 124 (Edward Alexander ed., Broadview Press 1999) (1859).

64. *See, e.g.*, Daniel Kahneman & Richard H. Thaler, *Utility Maximization and Experienced Utility*, 20 J. ECON. PERSP. 221 (2006).

65. *See* John Beshears et al., *How Are Preferences Revealed?*, 92 J. PUB. ECON. 1787 (2008); Cass R. Sunstein & Richard Zeckhauser, *Dreadful Possibilities, Neglected Probabilities*, *in* THE IRRATIONAL ECONOMIST: MAKING DECISIONS IN A DANGEROUS WORLD 116 (Erwin Michel-Kerjan & Paul Slovic eds., 2010).

66. An American twenty-year-old can expect to live, on average, for 58.8 more years, while an eighty-year-old's remaining life expectancy is only 9.1 years. *See* Elizabeth Arias, *United States Life Tables, 2004*, 56 NAT'L VITAL STAT. REP., Dec. 28, 2007, at 1, 3.

67. *See* Michael J. Moore & W. Kip Viscusi, *The Quantity-Adjusted Value of Life*, 26 ECON. INQUIRY 369, 369–70 (1988).

migratory birds,[68] while another discovered approximately equal WTP to clean all the lakes in Ontario or to clean just a few.[69] These findings of "magnitude neglect" have been replicated across a wide variety of contexts, including, tellingly, the size of mortality risk reductions[70] and the length of periods of time.[71]

Psychologists have generally found that individuals are significantly more likely to exhibit magnitude neglect when they are emotionally aroused, when the good in question is difficult to evaluate, and when they are forced to consider goods in isolation as opposed to in comparison to different-sized alternatives.[72] All of these factors are present when a person considers how much she is willing to pay for a reduction in the probability of dying. The decision is affectively rich, involves evaluating highly unfamiliar and perplexing objects like "death" and "living the rest of life," and is performed in isolation, offering little opportunity for the purchaser to compare her future life to the future lives of others. As a result, it seems likely that individuals contemplating whether to purchase mortality risk reductions are insensitive to the size of their future lifespans.[73]

At least one study provides direct support for this idea. In a contingent valuation survey, Jill Morris and James Hammitt found no significant difference between current WTP for a risk reduction (in this case a hypothetical pneumonia vaccine) received at age sixty and current WTP for an equivalent risk reduction delayed until seventy.[74] This initially perplexing finding makes perfect sense if individuals do not readily appreciate the fact that risk reductions confer more value when life expectancy is longer because they are oblivious to the significant

68. William H. Desvousges et al., *Measuring Natural Resource Damages with Contingent Valuation: Tests of Validity and Reliability*, *in* CONTINGENT VALUATION: A CRITICAL ASSESSMENT 91, 94 (Jerry A. Hausman ed., 1993).

69. Daniel Kahneman & Jack L. Knetsch, *Valuing Public Goods: The Purchase of Moral Satisfaction*, 22 J. ENVTL. ECON. & MGMT. 57, 65 (1992).

70. *See, e.g.*, Jonathan Baron & Joshua Greene, *Determinants of Insensitivity to Quantity in Valuation of Public Goods: Contribution, Warm Glow, Budget Constraints, Availability, and Prominence*, 2 J. EXPERIMENTAL PSYCHOL.: APPLIED 107 (1996). For a review of the literature, see James K. Hammitt & John D. Graham, *Willingness to Pay for Health Protection: Inadequate Sensitivity to Probability?*, 8 J. RISK & UNCERTAINTY 33 (1999).

71. *See, e.g.*, Carey K. Morowedge et al., *Duration Sensitivity Depends on Stimulus Familiarity*, 138 J. EXPERIMENTAL PSYCHOL.: GENERAL 177 (2009); Carol Varey & Daniel Kahneman, *Experiences Extended Across Time: Evaluation of Moment and Episodes*, 5 J. BEHAV. DECISION MAKING 169 (1992).

72. *See* Christopher K. Hsee et al., *When Is More Better? On the Relationship Between Magnitude and Subjective Value*, 14 CURRENT DIRECTIONS IN PSYCHOL. SCI. 234, 235–36 (2005).

73. *See* Cass R. Sunstein, *Lives, Life-Years, and Willingness to Pay*, 104 COLUM. L. REV. 205, 234 (2004) ("It is possible that in contingent valuation studies or in market behavior, the number of years is 'telescoped' into a kind of single unit, called 'the rest of life.'").

74. Jill Morris & James K. Hammitt, *Using Life Expectancy to Communicate Benefits of Health Care Programs in Contingent Valuation Studies*, 21 MED. DECISION MAKING 468, 473–74 (2001).

impact that the length of a future life has on the amount of welfare it contains.

Public choice studies may help solve this problem. By asking respondents about risk reductions for others rather than for themselves, these studies avoid eliciting the affective arousal that comes with contemplating the prospect of one's own death. In addition, public choice studies promote comparative evaluation. Rather than ask respondents about the absolute value of saving twenty-year-olds or sixty-year-olds, they ask for a relative prioritization of age groups. Consequently, the public choice approach is far more likely to bring about the kind of reflective cognitive evaluation that responds to differences in magnitude. Indeed, the fact that younger individuals have more years left to live is one of the primary explanations public choice study respondents offer for prioritizing young lives.[75]

Of course, the preferences expressed in public choice studies likely respond to more than just welfare considerations.[76] As a result, it is dubious to attribute the strong preferences identified by these studies solely to public perceptions of welfare benefits focusing on the safety of the young. But nonetheless, public choice studies likely offer a directionally accurate guide to the welfare consequences of age adjustment.

Individual WTP studies, by contrast, may not provide much useful information about the differential welfare benefits of safety for different age groups because persons contemplating risk reductions for themselves are likely to be insensitive to the magnitude of their future lifespans. Furthermore, any useful signals may be lost in the noise created by differences in the marginal utility of money between age groups.[77]

Therefore, if we want to employ the CBA procedure that is most likely to recommend welfare-enhancing policies, we might more justifiably rely on the age adjustments suggested by public choice studies than on the individual WTP data that guide current agency practice.

III. MOVING BEYOND WELFARE

Cost-benefit analysis, as traditionally practiced, "is premised on the notion that public policy should impartially and objectively reflect the determinants of individual well-being, paying no heed whatsoever to goals or interests that are articulated at the collective level."[78] In keeping with this tradition, the previous

75. *See* Eisenberg et al., *supra* note 32, at 152; Tsuchiya et al., *supra* note 34, at 694.

76. *See infra* Part III.

77. *See* discussion *supra* Subsection II.B.1.

78. DOUGLAS A. KYSAR, REGULATING FROM NOWHERE: ENVIRONMENTAL LAW AND THE SEARCH FOR OBJECTIVITY 15 (2010); *accord* FRANK ACKERMAN & LISA HEINZERLING, PRICELESS: ON KNOWING THE PRICE OF EVERYTHING AND THE VALUE OF NOTHING 37 (2004); *see also* ANDERSON, *supra* note 23, at 190; Alexander Volokh, *Rationality or Rationalism? The Positive and*

Part defended the use of public choice data for age adjustment within a welfarist, individualist framework. Yet many critics find such reductionism unappealing; they argue that it renders regulation incapable of responding to a wide range of publicly held values[79] and saps health and safety protections of important expressive meanings.[80] Their views have recently penetrated the regulatory state, which appears to be moving towards a broader approach to policy analysis. President Obama's Executive Order 13,563—"a kind of mini-constitution for the regulatory state"[81]—calls upon regulators to "take into account benefits and costs, both quantitative and qualitative," including "fairness," "distributive impacts," and "human dignity."[82]

If, in line with Executive Order 13,563's dictates, we accept that regulatory analysis is about more than just welfare maximization, then the case for basing age adjustments on public choice studies instead of individual WTP metrics grows even stronger.[83] Public choice studies may very well be better than their individual WTP counterparts at reflecting the differential welfare consequences of allocating safety to the young and old. Yet there is no doubt that they are more adept at incorporating extra-welfarist convictions—in particular, beliefs about fairness—that have a significant bearing on how society wishes to see its regulatory priorities ordered.

A. Incorporating Extra-Welfarist Concerns

The public choice elicitation method is, by its very nature, flexible. Experimental subjects asked which policy programs they prefer can pick one option or another for any reason—including reasons that do not concern what *they*, as individuals, would do, but instead what *we*, as a political community, should do. Individual WTP research, by contrast, offers its subjects a narrow choice—whether to purchase, or not purchase, a particular product for

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Normative Flaws of Cost-Benefit Analysis, 48 HOUS. L. REV. 79, 90 (2011).

79. ANDERSON, *supra* note 23, at 210.

80. KYSAR, *supra* note 78, at 101.

81. Cass R. Sunstein, *The Real World of Cost-Benefit Analysis: Thirty-Six Questions (and Almost as Many Answers)* (Harvard Public Law, Working Paper No. 13-11, 2013), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2199112.

82. Exec. Order No. 13,563, 76 Fed. Reg. 3821, 3821 (Jan. 18, 2011). Changing the way that CBA is conducted has profound implications for regulation, because CBA is mandated for all "economically significant" regulations by executive order. *See* Exec. Order No. 12,866, 3 C.F.R. 638 (1994); Exec. Order No. 12,291, 3 C.F.R. 127 (1982).

83. I will not attempt restate all the arguments made by critics of narrow cost-benefit analysis—nor those of its defenders—here. I merely wish to explore the implications of a broader conception of cost-benefit analysis for the question of age adjustment. For an array of persuasive critiques of narrow CBA, see KYSAR, *supra* note 78, at 99–119. For a full-throated defense of traditional CBA, see John D. Graham, *Saving Lives Through Administrative Law and Economics*, 157 U. PA. L. REV. 395 (2008).

themselves. It is, by design, incapable of responding to "goals or interests that are articulated at the collective level."[84]

This disparity is particularly evident with regard to questions of fairness. The decision of how to allocate lifesaving resources between young and old is as much about equity as it is about efficiency.[85] Life-years saved do not accrue to society collectively, but rather to particular individuals, and deciding which individuals deserve what is a thorny ethical problem. Some have argued that prioritizing the young over the old, even if welfare-enhancing, violates our commitment to equal respect for persons.[86] Others counter that *failing* to prioritize the young is the true injustice, since it puts an unfair premium on the life-years of the elderly.[87] Still others contend that the principles of equality actually require us to overweight the life-years of the young, since the young have enjoyed fewer opportunities for living thus far, whereas the old have already had their "fair innings" of life.[88]

The key point is that individual WTP studies are fundamentally incapable of reflecting any of these considerations because they only elicit individuals' valuations of risk reductions for themselves, and offer no opportunity for respondents to indicate how their claims for safety compare to those of others.[89] Public choice studies, on the other hand, specifically ask respondents to make interpersonal comparisons, and are therefore highly responsive to citizens' beliefs about fairness. Indeed, convictions regarding what is fair appear to be the primary drivers of subject behavior in public choice experiments. Aki Tsuchiya and his colleagues, for example, found that the most common explanation for their respondents' decisions to prioritize risk reductions for the young was a belief that the young deserved more protection because they had not yet lived as long.[90]

Equity in lifespan allocation is not the only extra-welfarist concern driving public choice study results. Some researchers have found that subjects prioritized different age groups based on their belief that parents should receive greater

84. KYSAR, *supra* note 78, at 15.

85. For discussions of the ethical issues raised, see, for example, JOHN MCKIE ET AL., THE ALLOCATION OF HEALTH CARE RESOURCES: AN ETHICAL EVALUATION OF THE QALY APPROACH 47–73 (1998); and Klemens Kappel & Peter Sandoe, *QALYs, Age and Fairness*, 6 BIOETHICS 297, 311–16 (1992).

86. *See, e.g.*, JOHN HARRIS, THE VALUE OF LIFE, 91–94 (1985).

87. *See, e.g.*, Sunstein, *supra* note 73, at 216–21.

88. *See, e.g.*, Alan Williams, *Intergenerational Equity: An Exploration of the "Fair Innings" Argument*, 6 HEALTH ECON. 117, 119 (1997).

89. *Cf.* ANDERSON, *supra* note 23, at 211 ("Some of the concerns people have as citizens cannot in principle be expressed in their roles as consumers, but must be expressed through their political relations with other citizens.").

90. Tsuchiya et al., *supra* note 34, at 694; *accord* Eisenberg et al., *supra* note 32, at 152.

protections because of their unique social role as family providers.[91] Others found that subjects prefer to allocate safety to the young because the young still have much to contribute to society.[92] The potential array of beliefs is virtually unlimited; the important takeaway is that public choice evaluation can incorporate them all.

The fact that the age adjustments suggested by public choice studies reflect a broad range of extra-welfarist concerns that individual WTP studies ignore altogether has important implications for the type of broad policy analysis recommended by Executive Order 13,563. If regulators are to "take into account benefits and costs, both quantitative and qualitative," including "fairness" and "dignity,"[93] then it is essential that they incorporate measures like public choice data. Employing metrics that respond to all of the potential reasons citizens could have for preferring one approach to another—including those that only arise at the collective level—enables policymakers to take account of concerns like equity and distributive justice. This type of inclusive review is impossible if regulators restrict themselves to individual WTP metrics, which only reflect narrow welfare considerations.

B. Do Public Choice Studies Accurately Reflect Societal Convictions?

Some might nonetheless question whether public choice studies accurately mirror society's consensus on VSL age adjustment, or challenge whether views expressed through a (admittedly very sophisticated) form of "opinion polling" should be normative for public policy at all. Cass Sunstein, for example, one of the foremost scholars of cost-benefit analysis, attacks both the reliability of public choice data and the very idea of trying to determine our regulatory priorities by asking citizens what they think. He asserts that responses to public choice surveys "are highly likely to depend on how the questions are set up," and that "even if people do have stable answers to such questions, it is unclear that those answers have any moral standing for purposes of policy and law."[94]

These criticisms deserve attention, but they seem overblown. Sunstein's characterization of public choice results as irredeemably volatile is unfair. While the magnitude of age-based preferences may vary across studies, their direction and significance are remarkably consistent.[95] And if public choice studies do reflect stable preferences, then why should they not influence public policy?

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91. *See, e.g.*, Cropper et al., *supra* note 31, at 258.

92. *See* Eisenberg et al., *supra* note 32, at 152.

93. Exec. Order No. 13,563, 76 Fed. Reg. 3821, 3821 (Jan. 18, 2011).

94. Sunstein, *supra* note 73, at 242.

95. For that matter, the differences in magnitude are small compared to the variance found in traditional VSL studies. The lowest and highest of the 26 VSL values used by the EPA, for example, vary by a factor of approximately 23. *EPA Guidelines*, *supra* note 22, at B-2 tbl.B-1.

Sunstein seems to worry that public choice studies will reflect objectively bad preferences that trample upon minority rights. "Suppose, for example," he speculates, "that a relevant population concluded that it would rather save one hundred white lives than one hundred African American lives."[96] In such a circumstance a policymaker might, indeed, hesitate to act on the will of the majority. Yet age adjustment is not such a circumstance. One of the most remarkable features of public choice surveys is that they find that both young and old alike embrace the idea of prioritizing lifesaving for the young.[97] As a result, it is hard to write off their results as mere bigotry.

More generally, Sunstein asserts that "a deliberative democracy . . . should not make policy on the basis of opinion polls."[98] Yet this argument seems to ignore the fact that an individual WTP-based age adjustment regime also looks to citizens' preferences—either as stated in surveys or as revealed in market behavior—for definitive guidance on what government should do. In fact, in a contest of which procedure more closely adhered to the ideals of "deliberative democracy," asking individuals how society should allocate its lifesaving resources would seem to have a clear advantage over asking individuals how much they were willing to pay to reduce risks to their own lives.

A more powerful objection to using public choice data in CBA is that the best expression of societal consensus on VSL age adjustment comes not from any empirical study, but rather from the powerful opposition to senior discounting expressed by protestors and activists in 2003. Sean Hannon Williams, for example, writes that

> This public debate . . . essentially transferred the decision about which [age adjustment] model to follow from the agency to the political arena. In that arena, the normative assumptions underlying the models took center stage. Politicians and the public had to grapple with the potential justifications for providing less safety for the elderly than for others. The public ultimately rejected any such justifications and in doing so gave the EPA painfully clear guidance on which model contained the stronger normative assumptions.[99]

Yet this rosy view of democratic participation in the regulatory process deserves a second look. First, it is unclear exactly how many people made up the "public" that rejected senior discounting. The entire fracas may speak more to the power of interest group politics, and the considerable clout wielded by organizations like the AARP, than to the presence of widely held opposition to VSL age adjustment among the American people. Even more importantly,

96. Sunstein, *supra* note 73, at 244.
97. *See supra* notes 30–31 and accompanying text.
98. Sunstein, *supra* note 73, at 245.
99. Sean Hannon Williams, *Statistical Children*, 30 YALE J. ON REG. 63, 116 (2013).

discomfort with the EPA's senior discounting in 2003 may have stemmed from certain features of how it was implemented and what that implied about its goals rather than from any actual disagreement with the principle that regulatory policy should be especially solicitous of younger lives.

Specifically, much of the public opposition to senior discounting can likely be attributed to two concerns, one practical and the other expressive. I will label the first the "O'Donnell Critique" after Frank O'Donnell, an environmental advocate with Clean Air Watch. O'Donnell responded to a later controversy, which arose when the EPA decided to reduce its official VSL estimate by $1 million in the spring of 2008,[100] by saying that the EPA's move was "really a devious way of cooking the books," designed to make "the perceived benefits of cleaning up the air seem less."[101] The second type of objection is the "Boxer Critique," named for Senator Barbara Boxer, who once sponsored a bill that attempted to ban the EPA from ever reducing its VSL figure. When pitching her proposal, Boxer argued that "EPA may not think that Americans are worth all that much, but the rest of us believe the value of an American life to our families, our communities, our workplaces and our nation is no less than it ever has been."[102]

The O'Donnell Critique sees senior discounting as a transparent ploy to roll back regulatory protections in the service of nefarious corporate interests. Its quarrel is not with the devaluation of seniors, per se, but rather with the idea that any person should receive less protection than the already inadequate baseline. It helps explain why the Public Interest Research Group, a longtime opponent of deregulation, was particularly interested in fighting the EPA's *Clear Skies* analysis.

The Boxer Critique, on the other hand, responds to more metaphysical concerns. It identifies an expressive harm in "devaluing" the lives of seniors, or anyone else for that matter. Its objection is less with the differential policy choices that might result from senior discounting than with the very idea of saying that certain people are "worth more" than others, and the correspondingly unsavory implications of ever concluding that anyone is "worth less."[103]

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100. For a description of the controversy, see Viscusi, *supra* note 37, at 113–21.

101. David A. Fahrenthold, *Cosmic Markdown: EPA Says Life Is Worth Less*, WASH. POST, July 19, 2008, http://articles.washingtonpost.com/2008-07-19/news/36859681_1_human-life-statistical-life-air-pollution.

102. Press Release, Sen. Barbara Boxer, U.S. Sen. Comm. on Env't & Pub. Works (July 11, 2008), http://www.epw.senate.gov/public/index.cfm?FuseAction=Majority.PressReleases&ContentRecord_id=13d16bd9-802a-23ad-4796-ab5314d6439d&Region_id=&Issue_id=.

103. This reaction speaks to the tremendous gap between the way the word "value" is used by economists and by laypersons. *See* Trudy Ann Cameron, *The Value of Statistical Life: [They] Do Not Think It Means What [We] Think It Means*, 28 ASS'N OF ENVTL. & RESOURCE ECON. NEWSL, Nov. 2008, at 36.

The key point is that neither the O'Donnell Critique nor the Boxer Critique is inherently opposed to the principle that government should prioritize risk reductions for the young over risk reductions for the old. Those of O'Donnell's persuasion might be satisfied as long as age adjustments took the form of "youth premiums" rather than "senior discounts," thereby ensuring that the modifications led to a greater overall level of regulatory protection.[104] Meanwhile, the Boxer acolytes' concerns could be assuaged if agencies focused on monetizing life-years rather than lives. If the EPA were to conduct a sensitivity analysis that employed an invariant life-year value for all citizens, thereby indirectly placing greater value on younger lives, it might not generate the same revulsion among Boxerites as the 2003 senior discount,[105] in spite of the fact that the two analytical techniques would have similar policy consequences.

It would require additional empirical research to establish whether the O'Donnell and Boxer Critiques, rather than genuine opposition to the idea of allocating regulatory protection on the basis of age, accounted for the public's adverse reaction to senior discounting in 2003. At the very least, though, thinking about the problem in this light shows how it is possible to reconcile the tremendous enthusiasm for age adjustment expressed in public choice studies with the fierce opposition to senior discounting expressed by the PIRG and AARP. The former is an endorsement of prioritizing risk reductions for the young. The latter may only be an objection to deregulation, and to the expressive meaning of a particular style of VSL age adjustment. Agencies could satisfy the preferences expressed in public choice studies without triggering O'Donnell's or Boxer's criticism simply by adopting the right kind of age adjustments (i.e., by monetizing life years rather than lives and by employing youth premiums in place of senior discounts).

We can therefore accept public choice studies as a valid expression of society's beliefs on how government should allocate lifesaving resources in spite of the ostensibly contradictory evidence offered by recent history. And as a result, if we want to make regulatory analysis respond to more than just narrow conceptions of individual welfare, basing age adjustments on public choice data rather than on individual WTP studies would be an advisable step to take.

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104. An example of how "youth premium" analyses can win support is offered by the Department of Transportation rule discussed *infra* Part IV.

105. In fact, agencies have used invariant VSLY analyses before without raising many objections. *See* Sunstein, *supra* note 73, at 252. Life-year analysis is also pervasive in healthcare, where the quality-adjusted life-year, or "QALY," is a frequently employed metric. *See* Graham Loomes & Lynda McKenzie, *The Use of QALYs in Healthcare Decision Making*, 28 SOC. SCI. & MED. 299 (1989).

IV. HOW SHOULD WE INCORPORATE PUBLIC CHOICE DATA INTO COST-BENEFIT ANALYSIS?

Once we accept the benefits of incorporating public choice studies into regulatory analysis, we are still left with the question of how to do so. Many scholars seem to believe that reform is only possible outside the confines of quantitative policymaking.[106] Similarly, Executive Order 13,563 acknowledges that extra-welfarist concerns are often "impossible to quantify," and therefore will usually appear alongside, rather than as part of, traditional cost-benefit analysis.[107] This offers one approach to how public choice studies could be incorporated into regulatory policy—as a qualitative corollary to cost-benefit analysis that might lead agencies to favor certain policies because of the relative youth of their beneficiaries in spite of the fact that their monetized benefits fall short of their costs.

An interesting example of this approach comes from the Department of Transportation's (DOT) recent rulemaking on rearview auto safety.[108] Though DOT found that its stringent proposed standards would cost more than $12 million per prevented fatality, which is well above standard VSL estimates, it nonetheless decided to proceed, noting that "the quantitative analysis does not offer a complete accounting."[109] As DOT recognized, "[W]ell over 40 percent of the victims of backover crashes are very young children (under the age of five), with nearly their entire life ahead of them."[110] Furthermore, the regulation would "in many cases, reduce a qualitatively distinct risk, which is that of directly causing the death or injury of one's own child."[111] DOT made no attempt to quantify precisely how much more tragic a child's death—much less one caused by a parent—was than a regular adult fatality. It simply appealed to these considerations as qualitative reasons for adopting the regulation in spite of the fact that the quantitative accounting failed to add up.[112]

While this represents one path for age adjustment, an alternative approach would be to integrate public choice directly into CBA. The results of public choice studies could support either VSL adjustments or the adoption of

106. *See, e.g.*, ANDERSON, *supra* note 23, at 210–16.

107. Exec. Order 13,563, 76 Fed. Reg. 3821, 3821 (Jan. 18, 2011).

108. *See* Federal Motor Vehicle Safety Standard, Rearview Mirrors, 75 Fed. Reg. 76,186 (proposed Dec. 7, 2010) (to be codified at 49 C.F.R. pts. 571 and 585).

109. *Id.* at 76,238.

110. *Id.*

111. *Id.*

112. It is interesting to note that this effort failed to inspire the type of popular backlash witnessed by the EPA's senior discounting in 2003. This likely reflects the fact that the age adjustments here took the form of "youth premiums" rather than "senior discounts." It may also result from people's greater willingness to accept differentiation between children and adults than between adults of different ages. *See* Williams, *supra* note 99, at 81–84.

something resembling a constant value-of-life-year measure.[113] Both of these techniques could roughly replicate the marginal rate of substitution between saving individuals of different ages evidenced by public choice studies. Agencies could routinely present analyses informed by traditional WTP metrics alongside those conducted with public choice data, using both to gain perspective on the policy in question.[114] This approach would resemble similar proposals scholars and regulators have offered for using child and cancer premiums.[115]

The choice between these two alternatives—bringing public choice data in at the front end through direct incorporation into CBA, or in at the back as a means of supporting policymakers' discretion to override CBA—depends on what we want cost-benefit analysis to be. On one account, even progressive critics should seek to "mend, not end" CBA,[116] in which case it might be advantageous to make public choice studies part of the mending process. This approach has the advantage of preserving CBA's function as a check on agency discretion that keeps regulators from openly pursuing pro-regulatory or deregulatory agendas and promotes consistency across agencies.[117] It may also make it easier for voices advocating for broader policy analysis to avoid being silenced in the rulemaking process.[118]

On the other hand, perhaps incorporating public choice studies directly into CBA only perpetuates the fallacy of trying to translate all of our moral concerns into a single measure of dollars and cents.[119] Perhaps we *want* greater agency discretion as a means of openly acknowledging the value judgments inherent in our regulatory decisions, and exposing these judgments to political, rather than merely technocratic, scrutiny.[120] In that case, it might be better to make public choice studies one of the many factors policymakers can qualitatively consider

113. Current OMB guidance, by contrast, counsels against VSL age adjustment entirely, and instructs agencies to use higher VSLY values for senior citizen. *See Circular A-4*, *supra* note 12, at 30.

114. *See* Williams, *supra* note 99, at 106–17 (discussing the benefits of an "alternate models" approach).

115. *See id.* at 106 (child premiums); *Valuing Mortality Risk Reductions for Environmental Policy: A White Paper*, NAT'L CTR. FOR ENVTL. ECON. & EPA, 26 (Draft 2010), http://www.sra.org/sites/default/files/u32/EPA_Valuing_mortality_risk_2010.pdf (cancer premiums).

116. RICHARD L. REVESZ & MICHAEL A. LIVERMORE, RETAKING RATIONALITY: HOW COST-BENEFIT ANALYSIS CAN BETTER PROTECT THE ENVIRONMENT AND OUR HEALTH 10 (2008).

117. *See* ADLER & POSNER, *supra* note 48, at 101.

118. *See* Douglas A. Kysar, *Politics by Other Meanings: A Comment on* "Retaking Rationality *Two Years Later*," 48 HOUS. L. REV. 43, 76 (2011) (arguing that if "cost-benefit analysis is here to stay[,] . . . then proponents of environmental, health, and safety regulation would do well to start talking the talk as best they can").

119. *See* ANDERSON, *supra* note 23, at 215 ("[N]o context-independent, global consequentialist formula for identifying and aggregating costs and benefits is generally valid . . . . [F]acts about costs and benefits must be provided in disaggregated form.").

120. *See* KYSAR, *supra* note 78, at 114.

alongside traditional CBA. Either way, there should be a role for public choice studies to play in regulatory analysis.

V. CONCLUSION

Public choice studies offer a more reliable window into citizens' preferences on age adjustment than measures of individual willingness to pay. First, they do a better job of capturing the differential welfare benefits of mortality risk reductions for different age groups by eliciting responses under conditions that induce reflective contemplation and minimize the corrupting influence of age-based differences in the marginal utility of money. Second, they incorporate extra-welfarist convictions that are ignored by individual WTP studies.

Public choice research therefore provides a more satisfying guide for VSL age adjustment than the individual WTP metrics that guide current practice. In light of this fact, agencies should rethink the role that alternative forms of evidence, such as public choice studies, play in CBA. Such open-mindedness could meaningfully reshape quantitative policymaking—especially in circumstances in which regulators are asked to determine the relative value of different kinds of benefits—making it more responsive to a broad range of societal convictions.

This would be a welcome development. It is, after all, important to remember what is really at stake when we talk about adjusting the VSL for age. At its base, this is a question about priorities. It turns on whether a community is willing to allocate more of its resources to save a young life than to save an older one. In a democratic polity, policymakers should engage with citizens' beliefs on such a fraught question rather than narrowly search for potential Pareto improvements. Regulators must accordingly consider what types of data most accurately reflect societal priorities. As long as public choice data fit the bill better than their individual WTP counterparts, they should not be ignored when agencies choose which lives to save.